Virology

Volume 193
1993

EDITORS

W. K. Joklik, EDITOR-IN-CHIEF M. J. Buchmeier R. Haselkorn M. M.-C. Lai B. Moss
J. R. Nevins P. Palukaitis J. K. Rose B. Sugden M. D. Summers P. K. Vogt

ASSOCIATE EDITORS

P. Ahlquist
R. Ahmed
G. Air
A. K. Banerjee
C. Basilico
K. I. Berns
G. W. Blissard
T. J. Braciale
P. Brown
G. Bruening
E. Carstens
B. J. Carter
C. Cheng-Mayer
F. V. Chisari
L. T. Chow
A. M. Colberg-Poley
R. W. Compans
R. C. Condit
J. A. Cooper
S. Dales
A. Dasgupta
A. J. Davison
D. Derse
D. DiMaio
P. C. Doherty
W. G. Dougherty
J. J. Dunn
E. Ehrenfeld
J. H. Elder
S. Emerson
L. W. Enquist
M. Feiss
B. N. Fields
S. J. Flint
W. R. Folk
D. A. Galloway
M. B. Gardner
E. P. Geiduschek
W. Gibson
S. P. Goff
R. M. Goodman
D. E. Griffin
C. Grose
B. H. Hahn
E. Harlow
M. Hayman
P. Hearing
J. Hiscott
M. S. Horwitz
M. M. Howe
S. H. Hughes
R. Hull
T. Hunter
A. O. Jackson
B. Jacobs
J. E. Johnson
R. E. Johnston
R. A. Katz
J. D. Keene
E. Kieff
D. F. Klessig
D. M. Knipe
R. M. Krug
H.-J. Kung
L. A. Laimins
R. A. Lamb
G. Letchworth
J. S. Lipsick
D. M. Livingston
L. S. Loesch-Fries
G. P. Lomonossoff
D. R. Lowy
P. A. Luciw
J. Majors
P. L. Marion
G. S. Martin
W. Mason
G. McFadden
J. E. Mertz
E. S. Mocarski, Jr.
P. Model
E. Moran
T. J. Morris
T. G. Morrison
R. W. Moyer
S. A. Moyer
F. A. Murphy
B. G. Neel
R. Nusse
D. J. O'Callaghan
P. Offit
R. A. Owens
P. Palese
A. C. Palmenberg
E. Paoletti
D. S. Parris
J. T. Patton
C. D. Pauza
G. N. Pavlakis
M. E. Peeples
S. Perlman
S. Pestka
B. M. Peterlin
R. F. Pettersson
D. J. Pickup
J. M. Pipas
P. M. Pitha-Rowe
R. D. Possee
L. E. Post
M. L. Privalsky
V. Racaniello
K. Radke
R. F. Ramig
L. Ratner
H. R. Revel
C. M. Rice
H. L. Robinson
G. F. Rohrmann
B. Roizman
C. Rosen
L. B. Rothman-Denes
C. E. Samuel
R. J. Samulski
P. A. Schaffer
B. S. Schaffhausen
R. Schlegel
C. Schmaljohn
J. E. Schoelz
M. Schubert
C. Seeger
B. M. Sefton
B. L. Semler
K. V. Shah
P. R. Shank
J. G. Shaw
S. Shuman
J. Sodroski
P. G. Spear
D. H. Spector
J. Stanley
M. F. Stinski
V. Stollar
S. E. Straus
J. H. Strauss
D. F. Summers
J. W. Summers
M. M. Susskind
R. I. Swanstrom
R. H. Symons
P. Tattersall
M. J. Tevethia
S. S. Tevethia
D. Trono
C. P. Van Beveren
J. L. Van Etten
I. M. Verma
L. E. Volkman
E. K. Wagner
R. L. Ward
R. G. Webster
W. S. M. Wold
F. Wong-Staal
J. L. Yates

ACADEMIC PRESS, INC.
Harcourt Brace Jovanovich, Publishers
San Diego New York Boston
London Sydney Tokyo Toronto

Copyright © 1993 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U. S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1993 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0042-6822/93 $5.00

MADE IN THE UNITED STATES OF AMERICA

This journal is printed on acid-free paper.

Contents of Volume 193

Number 1, March 1993

RNA-Stimulated NTPase Activity Associated with the p80 Protein of the Pestivirus Bovine Viral Diarrhea Virus	James K. Tamura, Paul Warrener, and Marc S. Collett	1
RNA Circularization Reveals Terminal Sequence Heterogeneity in a Double-Stranded RNA Virus	Giovanni Widmer	11
Biosynthesis of Reovirus-Specified Polypeptides: Identification of Regions of the Bicistronic Reovirus S1 mRNA That Affect the Efficiency of Translation in Animal Cells	Barbara A. Belli and Charles E. Samuel	16
The Encephalomyocarditis Virus 3C Protease Is Rapidly Degraded by an ATP-Dependent Proteolytic System in Reticulocyte Lysate	Michael D. Oberst, Timothy J. Gollan, Munish Gupta, Scott R. Peura, Joseph D. Zydlewski, Priya Sudarsanan, and T. Glen Lawson	28
Multiple Arginine Residues within the Basic Domain of HTLV-I Rex Are Required for Specific RNA Binding and Function	Stephen R. Hammes and Warner C. Greene	41
Canine Distemper Virus L Gene: Sequence and Comparison with Related Viruses	Mohinderjit S. Sidhu, Joseph P. Menonna, Stuart D. Cook, Peter C. Dowling, and Stephen A. Udem	50
Canine Distemper Terminal and Intergenic Non-protein Coding Nucleotide Sequences: Completion of the Entire CDV Genome Sequence	Mohinderjit S. Sidhu, Walter Husar, Stuart D. Cook, Peter C. Dowling, and Stephen A. Udem	66
The DNA Binding Domain of Herpes Simplex Virus Type 1 Origin Binding Protein Is a Transdominant Inhibitor of Virus Replication	H. C. Perry, D. J. Hazuda, and W. L. McClements	73
Expression of HTLV-I Env and Tax Recombinant Peptides in Yeast: Identification of Immunogenic Domains	Nelly Noraz, Serge Benichou, Pascal Madaule, Pierre Tiollais, Jean Claude Vernant, and Claude Desgranges	80
Nucleotide Sequence and Biological Properties of a Pathogenic Proviral Molecular Clone of Neurovirulent Visna Virus	Ólafur S. Andrésson, John E. Elser, Gregory J. Tobin, John D. Greenwood, Matthew A. Gonda, Gudmundur Georgsson, Valgerdur Andrésdóttir, Elsa Benediktsdóttir, Helga Maria Carlsdóttir, Einar O. Mäntylä, Björg Rafnar, Páll A. Pálsson, James W. Casey, and Gudmundur Pétursson	89
The Tobamovirus Capsid Protein Functions as a Host-Specific Determinant of Long-Distance Movement	Mark E. Hilf and William O. Dawson	106
Self-Limiting Infection by *int/nef*-Double Mutants of Simian Immunodeficiency Virus	Martina Vogel, Klaus Cichutek, Steve Norley, and Reinhard Kurth	115
Coronavirus (JHM) Replication within the Retina: Analysis of Cell Tropism in Mouse Retinal Cell Cultures	Yun Wang, Barbara Detrick, and John J. Hooks	124
Mechanisms for the Inhibition of HIV Replication by Interferons-α, -β, and -γ in Primary Human Macrophages	Pascal R. A. Meylan, John C. Guatelli, James R. Munis, Douglas D. Richman, and Richard S. Kornbluth	138

Directed Mutagenesis of a Sindbis Virus Pathogenesis Site	Randal J. Schoepp and Robert E. Johnston	149
A Conditional Mutant of vRel Containing Sequences from the Human Estrogen Receptor	Anthony J. Capobianco and Thomas D. Gilmore	160
Phylogenetic and Structural Analyses of MMTV LTR ORF Sequences of Exogenous and Endogenous Origins	Carolyn Brandt-Carlson, Janet S. Butel, and David Wheeler	171
Transcomplementation of VIF$^-$ HIV-1 Mutants in CEM Cells Suggests That VIF Affects Late Steps of the Viral Life Cycle	Dominique Blanc, Clive Patience, Thomas F. Schulz, Robin Weiss, and Bruno Spire	186
Varicella-Zoster Virus Transcription in Human Trigeminal Ganglia	Jeffery L. Meier, Robert P. Holman, Kenneth D. Croen, John E. Smialek, and Stephen E. Straus	193
Binding of Bovine Papillomavirus E1 to the Origin Is Not Sufficient for DNA Replication	Barbara A. Spalholz, Alison A. McBride, Trina Sarafi, and Jesse Quintero	201
Synthesis of the Putative Red Clover Necrotic Mosaic Virus RNA Polymerase by Ribosomal Frameshifting *in Vitro*	Z. Xiong, K. H. Kim, T. L. Kendall, and S. A. Lommel	213
Intracellular Transport and Virion Incorporation of *vpx* Requires Interaction with Other Virus Type-Specific Components	John C. Kappes, Jeffrey S. Parkin, Joan A. Conway, Justin Kim, Christie G. Brouillette, George M. Shaw, and Beatrice H. Hahn	222
Preliminary X-Ray Data Analysis of Crystalline Cowpea Chlorotic Mottle Virus	J. A. Speir, S. Munshi, T. S. Baker, and J. E. Johnson	234
Morphogenic Capabilities of Human Immunodeficiency Virus Type 1 *gag* and *gag–pol* Proteins in Insect Cells	Brendan P. Hughes, Timothy F. Booth, Alexander S. Belyaev, Dorion McIlroy, Jeremy Jowett, and Polly Roy	242
***In Vitro* Differentiation of Monocytoid THP-1 Cells Affects Their Permissiveness for HIV Strains: A Model System for Studying the Cellular Basis of HIV Differential Tropism**	Pascal R. A. Meylan, Celsa A. Spina, Douglas D. Richman, and Richard S. Kornbluth	256
The Number of Copies of an *a*-like Region in the Serotype-3 Marek's Disease Virus DNA Genome Is Variable	J. David Reilly and Robert F. Silva	268
Lytic Functions of Mutant Polyomavirus Large T-Antigen with Deletion of Retinoblastoma Protein-Binding Motif	Karin Söderbärg and Göran Magnusson	281
Precise Prediction of a K^k-Restricted Cytotoxic T Cell Epitope in the NS1 Protein of Influenza Virus Using an MHC Allele-Specific Motif	Judy Cossins, Keith G. Gould, Mike Smith, Paul Driscoll, and George G. Brownlee	289
PH-Dependent Pore Formation in Semliki Forest Virus-Infected *Aedes albopictus* Cells	M. Lanzrein, R. Weingart, and C. Kempf	296
Interferon α-Mediated Inhibition of Human Immunodeficiency Virus Type 1 Provirus Synthesis in T-Cells	Yasaman Shirazi and Paula M. Pitha	303
Defective Interfering RNA-Mediated Resistance against Cymbidium Ringspot Tombusvirus in Transgenic Plants	Ágnes Kollàr, Tamàs Dalmay, and Jozsef Burgyàn	313
African Swine Fever Virus Guanylyltransferase	L. Pena, R. J. Yáñez, Y. Revilla, E. Viñuela, and M. L. Salas	319

Molecular Characterization of Porcine Reproductive and Respiratory Syndrome Virus, a Member of the Arterivirus Group — Karl-Klaus Conzelmann, Nico Visser, Peter Van Woensel, and Heinz-Jürgen Thiel 329

Expression of the Vesicular Stomatitis Virus Nucleocapsid Protein Gene in *Escherichia coli:* Analysis of Its Biological Activity *in Vitro* — Tapas Das and Amiya K. Banerjee 340

Human Adenovirus Serotype 12 Virion Precursors pMu and pVI Are Cleaved at Amino-Terminal and Carboxy-Terminal Sites That Conform to the Adenovirus 2 Endoproteinase Cleavage Consensus Sequence — Paul Freimuth and Carl W. Anderson 348

Reovirus Protein λ3 Is a Poly(C)-Dependent Poly(G) Polymerase — Milbrey C. Starnes and Wolfgang K. Joklik 356

Baculovirus Expression of Gene 6 of the IDIR Strain of Group B Rotavirus (GBR): Coding Assignment of the Major Inner Capsid Protein — David A. Lindsay, Steven L. Vonderfecht, Michael J. Betenbaugh, and Joseph J. Eiden 367

Antibodies to Paramyxovirus Nucleoproteins Define Regions Important for Immunogenicity and Nucleocapsid Assembly — Kevin W. Ryan, Allen Portner, and K. Gopal Murti 376

Use of Helper Cells with Two Host Ranges to Generate High-Titer Retroviral Vectors — François-Loïc Cosset, Anne Girod, Frédéric Flamant, Antoine Drynda, Corinne Ronfort, Sandrine Valsesia, Rosa-Maria Molina, Claudine Faure, Victor-Marc Nigon, and Gérard Verdier 385

Phosphate Cycling on the Basic Protein of *Plodia interpunctella* Granulosis Virus — C. Joel Funk and Richard A. Consigli 396

***In Vitro* Guanylylation of Infectious Pancreatic Necrosis Virus Polypeptide VP1** — Peter Dobos 403

Mapping of the Polycistronic RNAs of Tomato Leaf Curl Geminivirus — Philip M. Mullineaux, Justin E. Rigden, Ian B. Dry, Leslie R. Krake, and M. Ali Rezaian 414

An In-Frame Insertion into the Sindbis Virus 6K Gene Leads to Defective Proteolytic Processing of the Virus Glycoproteins, a *Trans*-Dominant Negative Inhibition of Normal Virus Formation, and Interference in Virus Shut off of Host-Cell Protein Synthesis — Milton J. Schlesinger, Steven D. London, and Christine Ryan 424

Short Communications

Post-translational Processing of the Feline Immunodeficiency Virus Envelope Precursor Protein — Ernst J. Verschoor, Ellen G. J. Hulskotte, Joke Ederveen, Marck J. M. Koolen, Marian C. Horzinek, and Peter J. M. Rottier 433

***In Vitro* Infection of Human Bone Marrow by Feline Leukemia Viruses** — Richard A. Morgan, Ronna E. Dornsife, W. French Anderson, and Edward A. Hoover 439

Tissue Tropism of Avian Leukosis Viruses: Analyses for Viral DNA and Proteins — H. L. Robinson, L. Ramamoorthy, K. Collart, and D. W. Brown 443

Ross River Virus Variants Selected during Passage in Chick Embryo Fibroblasts: Serological, Genetic, and Biological Changes — P. J. Kerr, R. C. Weir, and L. Dalgarno 446

Analysis of Variability among Endogenous Ecotropic MuLV Loci in Laboratory Mice	Pascal Nouvel, Hervé Philippe, Hubert Condamine, and Jean-Jacques Panthier	450
Induction of Micronuclei by HTLV-I Tax: A Cellular Assay for Function	Franca Majone, Oliver J. Semmes, and Kuan-Teh Jeang	456
Localization of the African Swine Fever Virus Attachment Protein P12 in the Virus Particle by Immunoelectron Microscopy	A. L. Carrascosa, I. Saastre, P. González, and E. Viñuela	460
Identification of Proteins Encoded by Avian Reoviruses and Evidence for Post-translational Modification	Yawei Ni, Robert F. Ramig, and Maurice C. Kemp	466
Bovine Respiratory Syncytial Virus Nucleocapsid Protein Expressed in Insect Cells Specifically Interacts with the Phosphoprotein and the M2 Protein	Siba K. Samal, Manoj K. Pastey, Thomas H. McPhillips, and Sashi B. Mohanty	470
Analysis of Sequence Variation in Grapevine Yellow Speckle Viroid 1 Reveals Two Distinct Alternative Structures for the Pathogenic Domain	J. E. Rigden and M. A. Rezaian	474
Identification of Genomic Regions of the Herpesvirus of Turkeys (HVT) with Helper Activity for Avian Adeno-Associated Virus (AAAV)	Hans-Joachim Bauer, Sabine Schüller, Gerhard Monreal, and Werner Lindenmaier	478
The Block to HIV-1 Envelope Glycoprotein-Mediated Membrane Fusion in Animal Cells Expressing Human CD4 Can Be Overcome by a Human Cell Component(s)	Christopher C. Broder, Dimiter S. Dimitrov, Robert Blumenthal, and Edward A. Berger	483
The Outer Capsid Protein VP4 of Equine Rotavirus Strain H-2 Represents a Unique VP4 Type by Amino Acid Sequence Analysis	Michele E. Hardy, Mario Gorziglia, and Gerald N. Woode	492
The Activity of the Coat Protein Promoter of Chloris Striate Mosaic Virus Is Enhanced by Its Own and C1-C2 Gene Products	Xiangcan Zhan, Kim A. Richardson, Ann Haley, and Bret A. M. Morris	498
Genetic Reassortment between Avian and Human Influenza A Viruses in Italian Pigs	Maria R. Castrucci, Isabella Donatelli, Luigi Sidoli, Giuseppe Barigazzi, Yoshihiro Kawaoka, and Robert G. Webster	503
Selective Alteration of the Turnover of Interferon β mRNA in Peritoneal Macrophages from LPS-Hyporesponsive Mice and Its Role in the Defective Expression of Spontaneous Interferon	Sandra Gessani, Carl W. Dieffenbach, Lucia Conti, Paola Di Marzio, Kathleen L. Wilson, and Filippo Belardelli	507
Secretion of a Truncated Form of the Human Immunodeficiency Virus Type 1 Envelope Glycoprotein	Sabine Hallenberger, Simon P. Tucker, Randall J. Owens, Helene B. Bernstein, and Richard W. Compans	510
Primary Cleavage of the HAV Capsid Protein Precursor in the Middle of the Proposed 2A Coding Region	Xi-Yu Jia, Donald F. Summers, and Ellie Ehrenfeld	515
Sequence Analysis of the Nucleocapsid Protein Gene of Rat Coronavirus SDAV-681	Satoshi Kunita, Miki Mori, and Eiji Terada	520
HIV Infection of the BS-1 Human Stroma Cell Line: Effect on Murine Hematopoiesis	Howard N. Steinberg, James Anderson, Clyde S. Crumpacker, and Pamela A. Chatis	524

Autologous Neutralizing Antibodies Prevail in HIV-2 but Not in HIV-1 Infection — Ewa Björling, Gabriella Scarlatti, Agneta von Gegerfelt, Jan Albert, Gunnel Biberfeld, Francesca Chiodi, Erling Norrby, and Eva Maria Fenyö 528

African Swine Fever Virus Encodes a DNA Ligase — Rafael J. Yáñez and Eladio Viñuela 531

Baculovirus Expression of the ADRV Gene 5 Encoded Protein Produces an Oligomerized, Antigenic, and Immunogenic VP6 Protein — Erich R. Mackow, Mary Ellen Fay, Robin Werner-Eckert, Tao Hung, Zhang Ju Wang, and Guangmu Chen 537

Author Index for Volume 193, Number 1 543

Number 2, April 1993

Minireview

Folding and Assembly of Viral Membrane Proteins — Robert W. Doms, Robert A. Lamb, John K. Rose, and Ari Helenius 545

Regular Articles

Mutational Analysis of *Cis*-acting Sequences and Gene Function in RNA3 of Cucumber Mosaic Virus — Frédéric Boccard and David Baulcombe 563

Overexpression of Wild-Type p53 and c-Myc in Human Fetal Cells Transformed with Adenovirus Early Region 1 — Roger J. A. Grand, Philip S. Lecane, Sally Roberts, Michael L. Grant, David P. Lane, Lawrence S. Young, Christopher W. Dawson, and Phillip H. Gallimore 579

Release of Bluetongue Virus-like Particles from Insect Cells is Mediated by BTV Nonstructural Protein NS3/NS3A — Alex D. Hyatt, Yuan Zhao, and Polly Roy 592

Phenotypic and Functional Characterization of Mouse Attenuated and Virulent Variants of Foot-and-Mouth Disease Virus Type O_1 Campos — M. J. Jensen and D. M. Moore 604

Analysis of the Transforming Functions of Bovine Papillomavirus Type 4 — William D. Pennie, G. Joan Grindlay, Margaret Cairney, and M. Saveria Campo 614

Nucleotide Sequence and Genomic Organization of Rice Tungro Spherical Virus — P. Shen, M. Kaniewska, C. Smith, and R. N. Beachy 621

Enteric Adenovirus Type 40: Expression of E1B Proteins *in Vitro* and *in Vivo* — Andy Bailey, Nancy Mackay, and Vivien Mautner 631

Analysis of Proteins Encoded by IE Regions 1 and 2 of Human Cytomegalovirus Using Monoclonal Antibodies Generated against Recombinant Antigens — Bodo Plachter, William Britt, Rolf Vornhagen, Thomas Stamminger, and Gerhard Jahn . . 642

Characterization of the Role of Individual Protein Binding Motifs within the Hepatitis B Virus Enhancer I on X Promoter Activity Using Linker Scanning Mutagenesis — Kurt Gustin, Mark Shapiro, Wendy Lee, and Robert D. Burk 653

Overexpression of the HIV-1 Gag–Pol Polyprotein Results in Intracellular Activation of HIV-1 Protease and Inhibition of Assembly and Budding of Virus-like Particles — Velissarios Karacostas, Elizabeth J. Wolffe, Kunio Nagashima, Matthew A. Gonda, and Bernard Moss 661

3′-Terminal Nucleotide Sequences Important for the Accumulation of Cowpea Mosaic Virus M-RNA — Jonathan B. Rohll, Claire L. Holness, George P. Lomonossoff, and Andrew J. Maule 672

Bovine Leukemia Virus: Purification and Characterization of the Aspartic Protease — Armelle Menard, Robert Z. Mamoun, Serge Geoffre, Michel Castroviejo, Sophie Raymond, Gilles Precigoux, Michel Hospital, and Bernard Guillemain 680

Characterization of the Moloney Murine Leukemia Virus Stem Cell-Specific Repressor Binding Site — Geraldine Kempler, Breton Freitag, Brent Berwin, Oliver Nanassy, and Eric Barklis 690

The Growth Transformation of Human B Cells Involves Superinduction of *hsp*^{70} and *hsp*^{90} — Roy K. Cheung and Hans-Michael Dosch 700

Identification of HIV Vaccine Candidate Peptides by Screening Random Phage Epitope Libraries — Paul M. Keller, Beth A. Arnold, Alan R. Shaw, Richard L. Tolman, Francis Van Middlesworth, S. Bondy, V. K. Rusiecki, Scott Koenig, Susan Zolla-Pazner, Patricia Conard, Emilio A. Emini, and Anthony J. Conley 709

The Attachment Function of the Newcastle Disease Virus Hemagglutinin-Neuraminidase Protein Can Be Separated from Fusion Promotion by Mutation — Theresa Sergel, Lori W. McGinnes, Mark E. Peeples, and Trudy G. Morrison 717

Down-regulation of the Surface Expression of Class I MHC Antigens by Human Cytomegalovirus — Y. Yamashita, K. Shimokata, S. Mizuno, H. Yamaguchi, and Y. Nishiyama 727

Enrichment of Insertional Mutants Following Retrovirus Gene Trap Selection — Wen Chang, S. Catherine Hubbard, Christina Friedel, and H. Earl Ruley 737

DNA Packaging ATPase of Bacteriophage T3 — Miyo Morita, Masao Tasaka, and Hisao Fujisawa 748

Characterization of Vaccinia Surface Antigen Expressed by Recombinant Baculovirus — Shigeru Morikawa and Yoshiaki Ueda 753

DNA Sequence and Genetic Organization of the Unique Short (U_S) Region of the Simian Varicella Virus Genome — Thomas M. Fletcher III and Wayne L. Gray 762

Viral and Cellular Factors Influence the Activity of the Epstein–Barr Virus BCR2 and BWR1 Promoters in Cells of Different Phenotype — Tina Nilsson, Anna Sjöblom, Maria G. Masucci, and Lars Rymo 774

Amino Acid Changes in the L Polymerase Protein of Vesicular Stomatitis Virus Which Confer Aberrant Polyadenylation and Temperature-Sensitive Phenotypes — D. Margaret Hunt and Karen L. Hutchinson . . . 786

Adenovirus Early Region 4 and Viral DNA Synthesis — Eileen Bridge, Susan Medghalchi, Sukithida Ubol, Minsun Leesong, and Gary Ketner 794

Genome Structure of a Virus Infecting the Marine Brown Alga *Ectocarpus siliculosus* — Stefan T. J. Lanka, Michael Klein, Uwe Ramsperger, Dieter G. Müller, and Rolf Knippers 802

Replication of Minute Virus of Mice Minigenomes: Novel Replication Elements Required for MVM DNA Replication — Patrick Tam and Caroline R. Astell 812

Interactions of Murine Gammaherpesvirus 68 with B and T Cell Lines — N. P. Sunil-Chandra, S. Efstathiou, and A. A. Nash 825

Initiation of Human Cytomegalovirus Infection Requires Initial Interaction with Cell Surface Heparan Sulfate — Teresa Compton, Dawn M. Nowlin, and Neil R. Cooper 834

Identification of the Hepatitis A Virus Internal Ribosome Entry Site: *In Vivo* and *in Vitro* Analysis of Bicistronic RNAs Containing the HAV 5′ Noncoding Region — Michael J. Glass, Xi-Yu Jia, and Donald F. Summers 842

Coexpression of Truncated Human Cytomegalovirus gH with the UL115 Gene Product or the Truncated Human Fibroblast Growth Factor Receptor Results in Transport of gH to the Cell Surface — Richard R. Spaete, Karen Perot, Patricia I. Scott, Jay A. Nelson, Mark F. Stinski, and Carol Pachl 853

Characterization of the *in Vitro* System for the Synthesis of mRNA from Human Respiratory Syncytial Virus — Yung T. Huang, Rita R. Romito, Bishnu P. De, and Amiya K. Banerjee 862

Phylogenetic Analysis of the N8 Neuraminidase Gene of Influenza A Viruses — Takehiko Saito, Yoshihiro Kawaoka, and Robert G. Webster 868

Long-Term Noncytopathic Productive Infection of the Human Monocytic Leukemia Cell Line THP-1 by Human Immunodeficiency Virus Type 1 (HIV-1_{IIIB}) — Krystyna Konopka, Elizabeth Pretzer, Barbara Plowman, and Nejat Düzgüneş 877

Dengue 2 Virus NS2B and NS3 Form a Stable Complex That Can Cleave NS3 within the Helicase Domain — Carlos F. Arias, Frank Preugschat, and James H. Strauss 888

Genetic Analysis of Beet Curly Top Virus: Evidence for Three Virion Sense Genes Involved in Movement and Regulation of Single- and Double-Stranded DNA Levels — Sheriar G. Hormuzdi and David M. Bisaro 900

DNA Sequence and Transcriptional Analyses of the Region of the Equine Herpesvirus Type 1 Kentucky A Strain Genome Encoding Glycoprotein C — Tomio Matsumura, Richard H. Smith, and Dennis J. O'Callaghan 910

A Unique Conformation at the Carboxyl Terminus of the Small Hepatitis Delta Antigen Revealed by a Specific Monoclonal Antibody — Soon B. Hwang and Michael M. C. Lai 924

Symptomatology and Movement of a Cucumber Necrosis Virus Mutant Lacking the Coat Protein Protruding Domain — Morven A. McLean, Richard I. Hamilton, and D'Ann M. Rochon 932

Protective Immunity to Rotavirus-Induced Diarrhoea Is Passively Transferred to Newborn Mice from Naive Dams Vaccinated with a Single Dose of a Recombinant Adenovirus Expressing Rotavirus VP7sc — Gerald W. Both, Linda J. Lockett, Vijayalakshmi Janardhana, Stirling J. Edwards, A. Richard Bellamy, Frank L. Graham, Ludvik Prevec, and Marion E. Andrew 940

Nuclear Transport of Tobacco Etch Potyviral RNA-Dependent RNA Polymerase Is Highly Sensitive to Sequence Alterations — Xiao Hua Li and James C. Carrington 951

Architecture of Physalis Mottle Tymovirus as Probed by Monoclonal Antibodies and Cross-Linking Studies — Ramesh Kekuda, Anjali A. Karande, A. N. K. Jacob, and H. S. Savithri 959

Short Communications

A Novel Mutation within the Kinase Domain of v-abl Gene Responsible for Temperature-Sensitive Colony-Forming Ability in Soft Agar — Toshihiro Soma, Satoshi Tsukada, Yoshihiro Oka, Tadamitsu Kishimoto, and Haruo Sugiyama 967

Specificity of Satellite Activation by Tobacco Necrosis Virus Correlates with Nucleic Acid Hybridization Pattern between Helper Virus Isolates — Frank Meulewaeter, Xavier Danthinne, Robert Coutts, and John van Emmelo 971

α_2-Macroglobulin Is the Major Neutralizing Inhibitor of Influenza A Virus in Pig Serum — Kathleen A. Ryan-Poirier and Yoshihiro Kawaoka 974

RNA Insertions and Gene Duplications in the Nonstructural Protein p125 Region of Pestivirus Strains and Isolates *in Vitro* and *in Vivo* — Irene Greiser-Wilke, Ludwig Haas, Kurt Dittmar, Bernd Liess, and Volker Moennig 977

Identification of a Region in the Pr55^{gag}-Polyprotein Essential for HIV-1 Particle Formation — Andreas von Poblotzki, Ralf Wagner, Matthias Niedrig, Gerhard Wanner, Hans Wolf, and Susanne Modrow 981

Primary Structure of the Canine Adenovirus PVII Protein: Functional Implications — Faxing Cai and Joseph M. Weber 986

Productive Infection of Continuous Lines of Channel Catfish Leukocytes by Channel Catfish Virus — V. G. Chinchar, M. Rycyzyn, L. W. Clem, and N. W. Miller 989

Expression of the La Crosse M Segment Proteins in a Recombinant Vaccinia Expression System Mediates pH-Dependent Cellular Fusion — David R. Jacoby, Charles Cooke, Indira Prabakaran, Jocelyn Boland, Neal Nathanson, and Francisco Gonzalez-Scarano 993

The Role of the Amino Terminus of F_1 of the Newcastle Disease Virus Fusion Protein in Cleavage and Fusion — Trudy Morrison, Catherine McQuain, Theresa Sergel, Lori McGinnes, and Julie Reitter .. 997

Mutagenesis of the Virion-Sense Open Reading Frames of Tomato Leaf Curl Geminivirus — Justin E. Rigden, Ian B. Dry, Philip M. Mullineaux, and M. Ali Rezaian 1001

Transcripts of a Maize Chlorotic Mottle Virus cDNA Clone Replicate in Maize Protoplasts and Infect Maize Plants — Kay Scheets, Roya Khosravi-Far, and Robert C. Nutter 1006

Dolphin and Porpoise Morbilliviruses Are Genetically Distinct from Phocine Distemper Virus — T. Barrett, I. K. G. Visser, L. Mamaev, L. Goatley, M.-F. van Bressem, and A. D. M. E. Osterhaus 1010

Generation and Pathogenicity of an NB-tropic SL3-3 Murine Leukemia Virus — Christopher Y. Thomas, J. Dean Nuckols, Cheryl Murphy, and Don Innes 1013

Genome Organization of the Sigma Rhabdovirus: Six Genes and a Gene Overlap — Danielle Teninges, Françoise Bras, and Sybille Dezélée 1018

Hemadsorptive Activity of Transfected COS-7 Cells Expressing BHV-1 Glycoprotein gIII — Katsunori Okazaki, Tohru Kanno, Susumu Kiriya, Eiichi Honda, and Yuji Kono 1024

The Pseudorabies Virus Host-Shutoff Homolog Gene: Nucleotide Sequence and Comparison with Alphaherpesvirus Protein Counterparts — Herve Berthomme, Bernard Jacquemont, and Alberto Epstein 1028

Lambda Kil-Mediated Lysis Requires the Phage Context — Günter R. Reisinger, Arne Rietsch, Werner Lubitz, and Udo Bläsi 1033

The Interferon-Induced Double-Stranded RNA-Activated Human p68 Protein Kinase Inhibits the Replication of Vaccinia Virus — Sean Bong Lee and Mariano Esteban 1037

Absence of Mutation in the p53 and the Retinoblastoma Susceptibility Genes in Primary Cervical Carcinomas — Kong-Bung Choo and Kowit Yu Chong 1042

Identification of a Trans-Acting Activity from Liver That Stimulates Hepatitis A Virus Translation *in Vitro* — Michael J. Glass and Donald F. Summers 1047

Author Index for Volume 193 1051

Subject Index for Volume 193 1054

Application for Membership in the AMERICAN SOCIETY FOR VIROLOGY

The **AMERICAN SOCIETY FOR VIROLOGY** was founded in 1981 to provide a forum for investigators of human, animal, insect, plant, fungal, and bacterial viruses, whether the research involves clinical, ecological, biological, or biochemical approaches. The stated aim of the Society is to promote the exchange of information and stimulate discussion and collaboration among scientists active in all aspects of virology. These goals are achieved by means of meetings organized or sponsored by the Society, obtaining for the members reduced subscription rates for virological journals, soliciting travel grants to attend national and international meetings, and representation on national and international councils.

Eligibility: Any researcher interested or actively engaged in the study of viruses is welcome to apply for membership in the Society. Applicants will be considered for either of two types of membership:

Full Membership - Persons with at least three years of postdoctoral experience who are actively engaged in the study of viruses and provide evidence of present and past scientific contributions to the field of virology.

Associate Membership - Persons interested in or newly engaged in the study of viruses. Postdoctoral fellows and graduate students are encouraged to apply.

Application Process: Application for Full or Associate membership can be made on copies of this form. Memberships are initiated and renewed in January each year; nominations received after September 1 will be effective the following January. The Society would be pleased to receive applications from scientists of any country. Annual membership dues ($50 for Full membership and $10 for Associate membership) must be paid in U.S. dollars. Dues payment is to accompany this application.

To Apply: Complete and return this application with attachments as requested.

NAME: _____
AS YOU WANT IT TO APPEAR IN DIRECTORY AND ON MAILING LABEL

DEGREE(S) HELD/POSITION: _____

ADDRESS: _____
WHERE YOU WANT TO RECEIVE CORRESPONDENCE

_____

_____

_____

TELEPHONE: ( ) _____ **FAX:** ( ) _____

NOMINATED BY: _____
NAME OF NOMINATING ASV MEMBER

I enclose:
1) **my curriculum vitae**
2) **bibliography**
3) **nominating letter from a member of the Society**
4) **membership dues**

Type of Membership:
(Check One)

☐ **FULL**

☐ **ASSOCIATE**

Send to: Mary K. Estes, Ph.D.
Chairman, ASV Membership Committee
Division of Molecular Virology
Baylor College of Medicine
One Baylor Plaza - Room 923E
Houston, Texas 77030-3498

(THIS FORM MAY BE REPRODUCED)